

IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently amended) A low pressure processing system comprising a reaction vessel, an exhaust passage connected to a reaction vessel, and a gate valve that hermetically closes the exhaust passage by pressing a valving element against a valve seat to contact the same provided in the exhaust passage, said apparatus system being adapted to configured to process a substrate contained in the reaction vessel by a predetermined treatment by supplying a process gas into an interior of the reaction vessel while maintaining an atmosphere of a reduced pressure in the interior of the reaction vessel by evacuating the same through the exhaust passage, said system further comprising: at least one purge gas supply port opening into a gap between the valving element and the valve seat; and a purge gas supply passage through which a purge gas is supplied to the purge gas supply port

wherein:

the gate valve has a valving element and a valve seat;

the valve seat has a first annular surface and the valving element has a second annular surface opposing the first annular surface, the first or second annular surface being provided thereon with a sealing member;

the gate valve hermetically closes the exhaust passage by pressing the second annular surface of the valving element against the first annular surface of the valve seat with the sealing member being interposed between the first and second annular surfaces;

the gate valve also regulates pressure in the reaction vessel by adjusting a gap between the valving element and the valve seat;

the gate valve is provided therein with a plurality of first purge gas supply ports circumferentially arrayed beside the first annular surface of the valve seat to jet a purge gas along the first annular surface of the valve seat; and

the valving element is provided therein with a plurality of second purge gas supply ports circumferentially arrayed beside the second annular surface of the valving element to jet a purge gas along the second annular surface of the valving element.

2-3. (Canceled)

4. (Currently amended) The low pressure processing system according to any one of claims 1 to 3 claim 1, further comprising:

a purge at least one purge gas valve arranged in the purge gas supply passage to supply and stop supplying the purge gas provided to supply and stop supplying the purge gas from the first and second purge gas supply ports; and

a controller configured to control the purge gas valve so that the purge gas valve is opened to supply the purge gas when the interior of the reaction vessel is supplied with the process gas.

5. (Canceled)

6. (Currently amended) The low pressure processing system according to any one of claims 1 to 3 claim 1, further comprising a process gas supply system configured to supply the process gas into the reaction vessel to perform the predetermined treatment, wherein the process gas is such that a reaction product of the process gas is unavoidably deposited on an inner surface of the exhaust passage even if the exhaust passage is heated.

7. (Currently Amended) A low pressure processing method of performing a low pressure process by using a low pressure processing system including an exhaust passage connected to a reaction vessel, and a gate valve that hermetically closes the exhaust passage by pressing a valving element against a valve seat to contact the same, said method comprising:

providing a low pressure processing system, the system including a reaction vessel, an exhaust passage connected to the reaction vessel, and a gate valve, wherein:

the gate valve has a valving element and a valve seat;

the valve seat has a first annular surface and the valving element has a second annular surface opposing the first annular surface, the first or second annular surface being provided

thereon with a sealing member;

the gate valve hermetically closes an exhaust passage by pressing the second annular surface of the valving element against the first annular surface of the valve seat with the sealing member being interposed between the first and second annular surfaces;

the gate valve also regulates pressure in the reaction vessel by adjusting a gap between the valving element and the valve seat;

the gate valve is provided therein with a plurality of first purge gas supply ports circumferentially arrayed beside the first annular surface of the valve seat to jet a purge gas along the first annular surface of the valve seat; and

the valving element is provided therein with a plurality of second purge gas supply ports circumferentially arrayed beside the second annular surface of the valving element to jet a purge gas along the second annular surface of the valving element;

supplying a process gas into an interior of the reaction vessel while maintaining an atmosphere of a reduced pressure in the interior of the reaction vessel by evacuating the same through the exhaust passage, thereby processing a substrate contained in the reaction vessel by a predetermined treatment; and

supplying a purge the purge gas, from at least one purge gas supply port opening into a gap between the valving element and the valve seat of the gate valve, into the gap from the first and the second purge gas ports when the substrate is being processed by the predetermined treatment.

8. (Canceled)

9. (Currently amended) A pressure control valve, for installation in a gas passage to which a solid matter possibly adheres, configured to perform a pressure control operation by adjusting a gap between a valving element and a valve seat, said pressure control valve comprising:

at least one purge gas supply port opening into a gap between the valving element and the valve seat; and a purge gas supply passage through which a purge gas is supplied to the purge gas supply port comprising a valving element and a valve seat,

wherein:

the valve seat has a first annular surface and the valving element has a second annular surface opposing the first annular surface, the first or second annular surface being provided thereon with a sealing member;

the pressure control valve hermetically closes the exhaust passage by pressing the second annular surface of the valving element against the first annular surface of the valve seat with the sealing member being interposed between the first and second annular surfaces;

the pressure control valve also regulates pressure in a space connected to the pressure control valve by adjusting a gap between the valving element and the valve seat;

the pressure control valve is provided therein with a plurality of first purge gas supply ports circumferentially arrayed beside the first annular surface of the valve seat to jet a purge gas along the first annular surface of the valve seat; and

the valving element is provided therein with a plurality of second purge gas supply ports circumferentially arrayed beside the second annular surface of the valving element to jet a purge gas along the second annular surface of the valving element.

10-11. (Canceled)

12. (New) The low pressure processing method according to claim 7, wherein the process gas is such that a reaction product of the process gas is unavoidably deposited on an inner surface of the exhaust passage even if the exhaust passage is heated.

13. (New) The low pressure processing system according to claim 1, wherein the gate valve has a main body accommodating the valving element and the valve seat, the main body is provided therein with an annular communication chamber surrounding the valve seat, and the plurality of first purge gas supply ports are in communication with the annular communication chamber.

14. (New) The low pressure processing system according to claim 7, wherein the gate valve has a main body accommodating the valving element and the valve seat, the main body is provided

therein with an annular communication chamber surrounding the valve seat, and the plurality of first purge gas supply ports are in communication with the annular communication chamber.

15. (New) The pressure control valve according to claim 9, further comprising a main body accommodating the valving element and the valve seat, wherein the main body is provided therein with an annular communication chamber surrounding the valve seat, and the plurality of first purge gas supply ports are in communication with the annular communication chamber.